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(54) AMBIDEXTROUS SINGLE-POINT BREAKING SYSTEM FOR CERAMIC-CUTTING MACHINES

BILATERALES EINZELPUNKT-BRUCHSYSTEM FÜR KERAMIKSCHNEIDEMASCHINEN

SYSTÈME DE RUPTURE MONOPOINT AMBIDEXTRE POUR MACHINES DE COUPE DE CÉRAMIQUE

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Description

OBJECT OF THE INVENTION

[0001] The object of the present invention relates to a breakage system applied to ceramic cutting machines, which configuration and design allows it to be used by right-handed or left-handed people.

[0002] This invention is especially applicable to the construction industry.

TECHNICAL PROBLEM TO BE SOLVED AND BACKGROUND OF THE INVENTION

[0003] Single-point breakage systems in ceramic cutting machines are currently located between the two guides of said machines, on which a sliding carriage, carrying the cutting tool (known as a scoring wheel), moves.

[0004] The foregoing is due to the fact that once the ceramic is traced, it must be broken through one of the extremities of the tracing that is made.

[0005] The problem lays in that the actuating lever of the breakage system, which function is to break and separate the ceramic pieces, often interferes with the sliding carriage between the guides of the cutting machine, thereby complicating the tracing and breakage processes of the ceramic piece.

[0006] Likewise, there are cutting machines with the lever placed on the right side of the guides, which is problematic for left-handed users.

[0007] ES2027568 A6 discloses a breakage system as per the preamble of appended claim 1.

[0008] The present invention solves the unresolved problem in the present state of the art with respect to the use of the cutting machine, such that it facilitates the cutting process regardless if the operator is right-handed or left-handed.

[0009] This new invention reduces the number of movements when tracing and splitting the ceramic pieces, given that it allows tracing it with one hand and breaking the ceramic piece with the other, without the need to release the actuating lever of the breakage system.

DESCRIPTION OF THE INVENTION

[0010] This is achieved by a single-point ambidextrous breakage system comprising the combination of features of appended claim 1.

BRIEF DESCRIPTION OF THE FIGURES

[0011] In order to complete the description and with the purpose of aiding a better comprehension of the characteristics of the invention, a set of drawings have been attached to this specification as an integral part thereof, which represent the following in an illustrative rather than limitative manner:

Figure 1 shows a view of the ceramic piece cutting machine, representing the guides, the sliding carriage and an actuating lever of the breakage system of the invention, incorporated in the right side of the cutting machine.

Figure 2 is a view of the extractable actuating lever of the breakage system with its two placement possibilities, either on the right side or on the left side. The figures show how the lever on the right side appears as a continuous stretch, applicable to right-handed people, while the one on the left appears as a discontinuous stretch, applicable to left-handed people.

Figure 3a shows a detailed view of the die, the lower part of the breakage system of the cutting machine, with its different pieces, as well as the cam, the protrusion and the through shaft.

Figure 3b shows an overall view of the die and the separator, where the mechanism activating the actuating lever of the breakage system through the contact between the cam and the bearings of the die and the separator may be observed.

Figure 3c shows the set of the die and the separator once the casing covering the same is mounted.

Figures 3a, 3b and 3c are represented with the actuating lever of the breakage system installed on the right side.

[0012] The following is a list of the different elements represented in the figures integrating the invention:

1. Ceramic piece cutting machine.
2. Base of the cutting machine.
3. Sliding carriage.
4. Guides.
5. Ceramic piece.
6. Cam.
7. Separator.
8. Die.
9. Actuating lever of the breakage system.
10. Plastic pieces.
11. Upper casing.
12. Lower casing.
13. Through shaft.
14. Protrusion.
15. Ram.
16. Lateral ridges.
17. Hole.
18. Bearings.
19. Turret.

DETAILED DESCRIPTION

[0013] Ceramic cutting machines (1) are generally constituted by a base (2) on which guides (4) are mounted and through which a sliding carriage (3) moves longitudinally. Turrets (19) are arranged at both extremities of the base (2) of the cutting machine (1), where the extremities of the guides (4) are inserted. The sliding carriage (3) carries the cutting tool (known as a scoring wheel), in charge of tracing the ceramic piece (5). Once the tracing is complete on said ceramic piece (5), the same is broken by means of a breakage system.

[0014] The present invention comprises: an extractable actuating lever (9), which activates the breakage system; a through shaft (13); a cam (6); a die (8), located in the lower part of the breakage system below the supporting plane of the piece to be cut; and a separator (7) in the upper part of the breakage system, which in turns comprises a ram (15).

[0015] As shown in figures 1 and 2, the actuating lever (9) of the die (8) has been displaced towards the exterior of the guides (4) in the breakage system object of the invention. Said actuating lever (9) is extractable. This way, the path of the sliding carriage (3) is cleared such that it does not interfere with said lever (9).

[0016] Likewise, given that the actuating lever (9) may be coupled to both sides of the guides (4), it may be used indistinctly by right-handed or left-handed people.

[0017] In order to displace the lever (9) towards the exterior of the guides (4), the through shaft (13) to which it is joined has been lengthened.

[0018] Said through shaft (13) comprises, at each extremity thereof, a hole (17) to which the actuating lever (9) of the die (8) is coupled, either by pressure or by screwing.

[0019] Another advantage of locating the actuating lever (9) on one side of the guides (4) is that it allows exercising the tracing with one hand and breaking the ceramic piece (5) through the breakage system with the other in a more ergonomic manner, thereby reducing the number of movements and actions to carry out the tracing and breakage of ceramic pieces (5).

[0020] Both the die (8) and the ram (15) of the separator (7) have bearings (18) in the area of contact with the cam (6) to facilitate the displacement and reduce the force to be applied to carry out the breakage of the ceramic piece (5).

[0021] Figures 3a, 3b and 3c show how the breakage system comprises the die (8) in its lower part, while the upper part comprises a separator (7). The die (8) is located below the supporting plane of the piece (5) to be cut. Both the separator (7) and the die (8) apply the necessary force on the traced ceramic piece (5) to break the ceramic piece (5) through the tracing that is made. The set of both (7, 8) is guided through the lower casing (12).

[0022] By activating the actuating lever (9) of the breakage system, the through shaft (13) rotates and activates the movement of the cam (6), which in turn displaces the separator (7) and the die (8), by means of the use of the bearings (18), towards the ceramic piece (5).

[0023] As shown in figure 3b, the separator (7) comprises the ram (15) and two lateral ridges (16), each ridge (16) being located at each side of the tracing that is made. By moving the actuating lever (9), the die (8) and the separator (7) move closer to each other, exerting pressure on the ceramic piece (5) and producing the breakage thereof due to the tracing that was previously made.

[0024] Figure 3a shows how the die (8) comprises, at its free extremity, a small pyramidal-shape protrusion (14), where said protrusion (14) lifts and pushes the traced ceramic piece (5) against the lateral ridges (16) of the ram (15), thereby facilitating the breakage due to the tracing of said ceramic piece (5). Said die (8) remains hidden in the standby position until it is activated by the actuating lever (9).

[0025] Figures 3b and 3c show plastic pieces (10) arranged at the lateral ridges (16) of the ram (15), with the purpose of preventing damages to the surface of the ceramic pieces (5) during the breakage operation upon the exertion of pressure by the ridges (16) on the ceramic piece (5).

[0026] The present invention should not be limited to the embodiment described herein. Other configurations may be carried out by experts in the art based on the present description. Therefore, the scope of the invention is hereby defined by the following claims.

Claims

1. Single-point ambidextrous breakage system for ceramic cutting machines (1) that comprises:

- a sliding carriage (3),
- guides (4),
- an actuating lever (9),
- a through shaft (13),
- a cam (6),
- a die (8), located in the lower part of the breakage system below the supporting plane of a piece (5) to be cut,
- a separator (7) in the upper part of the breakage system, which in turn comprises a ram (15), and
- bearings (18),

characterized in that:

- the through shaft (13) protrudes towards the exterior sides of the guides (4), there being a hole (17) at each extremity of said through shaft (13) to which the extractable actuating lever (9) is coupled, due to which the activation of the breakage system can be carried out from either side of the guides (4), either from the left or from the right, regardless if the operator is left-handed or right-handed.

2. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 1, **characterized in that** the actuating lever (9) is coupled to the through shaft (13) by pressure.

3. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 1, **characterized in that** the actuating lever (9) is coupled to the through shaft (13) by screwing.

4. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to any one of the claims 2 or 3, **characterized in that** the through shaft (13) is fastened to a lower casing (12), which facilitates the guiding thereof.

5. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 4, **characterized in that** the separator (7) comprises the ram (15) in its free extremity.

6. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 5, **characterized in that** the ram (15) comprises two lateral ridges (16), arranged on each side of the tracing made on the ceramic piece (5), where said ridges (16) push the ceramic piece on the die (8).

7. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 6, **characterized in that** the die (8) comprises, in its free extremity, a small pyramidal-shaped protrusion (14) with a flattened tip, where said protrusion (14) lifts and pushes the traced ceramic piece (5) against the lateral ridges (16) of the separator (7).

8. Single-point ambidextrous breakage system for ceramic cutting machines (1) according to claim 7, **characterized in that** the lateral ridges (16) of the ram (15) have plastic pieces (10) arranged thereon.

Patentansprüche

1. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) das umfasst:

   - einen Schlitten (3),
   - Führungen (4),
   - einen Betätigungshebel (9),
   - eine durchgehende Welle (13),
   - einen Nocken (6),
   - ein Werkzeug (8), das sich in dem unteren Teil des Brech-Systems unterhalb der Auflageebene eines zu schneidenden Teils (5) befindet,
   - einen Separator (7) in dem oberen Teil des Brech-Systems, der seinerseits einen Drücker (15) umfasst, und
   - Lager (18),

   dadurch gekennzeichnet, dass

   - die durchgehende Welle (13) zu den Außenseiten der Führungen (4) hin vorsteht, wobei sich ein Loch (17) an jedem äußeren Ende der durchgehenden Welle (13) befindet, mit dem der herausziehbare Betätigungshebel (9) gekoppelt wird, so dass die Betätigung des Brech-Systems von beiden Seiten der Führungen (4) her ausgeführt werden kann, d. h., unabhängig davon, ob der Bedienende Linkshänder oder Rechtshänder ist, entweder von der linken oder von der rechten Seite.

2. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Betätigungshebel (9) durch Druck mit der durchgehenden Welle (13) gekoppelt wird.

3. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Betätigungshebel (9) durch Verschrauben mit der durchgehenden Welle (13) gekoppelt wird.

4. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach einem der Ansprüche 2 oder 3, **dadurch gekennzeichnet, dass** die durchgehende Welle (13) an einer unteren Einfassung (12) befestigt ist, wodurch das Führen derselben erleichtert wird.

5. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** der Separator (7) den Schieber (15) an seinem freien äußeren Ende umfasst.

6. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 5, **dadurch gekennzeichnet, dass** der Schieber (15) zwei Querstege (16) umfasst, die an jeder Seite der an dem Keramikteil (5) hergestellten Trennlinie angeordnet sind, wobei die Stege (16) das Keramikteil auf das Werkzeug (8) drücken.

7. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 6, **dadurch gekennzeichnet, dass** das Werkzeug (8) an seinem freien äußeren Ende einen kleinen pyramidenförmigen Vorsprung (14) mit einer abgeflachten Spitze umfasst und mit dem Vorsprung (14) das mit der Trennlinie versehene Keramikteil (15) angehoben und an die Querstege (16) des Se-

parators (7) gedrückt wird.

8. Einschneidiges, beidhändig bedienbares Brech-System für Keramik-Schneidmaschinen (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** an den Querstegen (16) des Schiebers (15) Kunststoffteile (16) angeordnet sind.

Revendications

1. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) qui comprend :

un chariot coulissant (3),
des guides (4),
un levier d'actionnement (9),
un arbre débouchant (13),
une came (6),
une matrice (8) positionnée dans la partie inférieure du système de rupture au-dessous du plan de support d'une pièce (5) à couper,
un séparateur (7) dans la partie supérieure du système de rupture, qui comprend à son tour un vérin (15), et
des paliers (18),

caractérisé en ce que :

l'arbre débouchant (13) fait saillie vers les côtés extérieurs des guides (4), on trouve un trou (17) à chaque extrémité dudit arbre débouchant (13) auquel est couplé le levier d'actionnement extractible (9) grâce auquel l'activation du système de rupture peut être réalisé à partir de chaque côté des guides (4), depuis la gauche ou depuis la droite, indépendamment que l'opérateur soit gaucher ou droitier.

2. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 1, **caractérisé en ce que** le levier d'actionnement (9) est couplé à l'arbre débouchant (13) par pression.

3. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 1, **caractérisé en ce que** le levier d'actionnement (9) est couplé à l'arbre débouchant (13) par vissage.

4. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon l'une quelconque des revendications 2 ou 3, **caractérisé en ce que** l'arbre débouchant (13) est fixé à un boîtier inférieur (12) qui facilite son guidage.

5. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 4, **caractérisé en ce que** le séparateur (7) comprend le vérin (15) dans son extrémité libre.

6. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 5, **caractérisé en ce que** le vérin (15) comprend deux crêtes latérales (16), agencées de chaque côté du traçage réalisé sur la pièce de céramique (5), où lesdites crêtes (16) poussent la pièce de céramique sur la matrice (8).

7. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 6, **caractérisé en ce que** la matrice (8) comprend, dans son extrémité libre, une petite saillie en forme de pyramide (14) avec une pointe aplatie, où ladite saillie (14) lève et pousse la pièce de céramique (5) tracée contre les crêtes latérales (16) du séparateur (7).

8. Système de rupture monopoint ambidextre pour des machines de coupe de céramique (1) selon la revendication 7, **caractérisé en ce que** les crêtes latérales (16) du vérin (15) ont des pièces en plastique (10) agencées sur ces dernières.

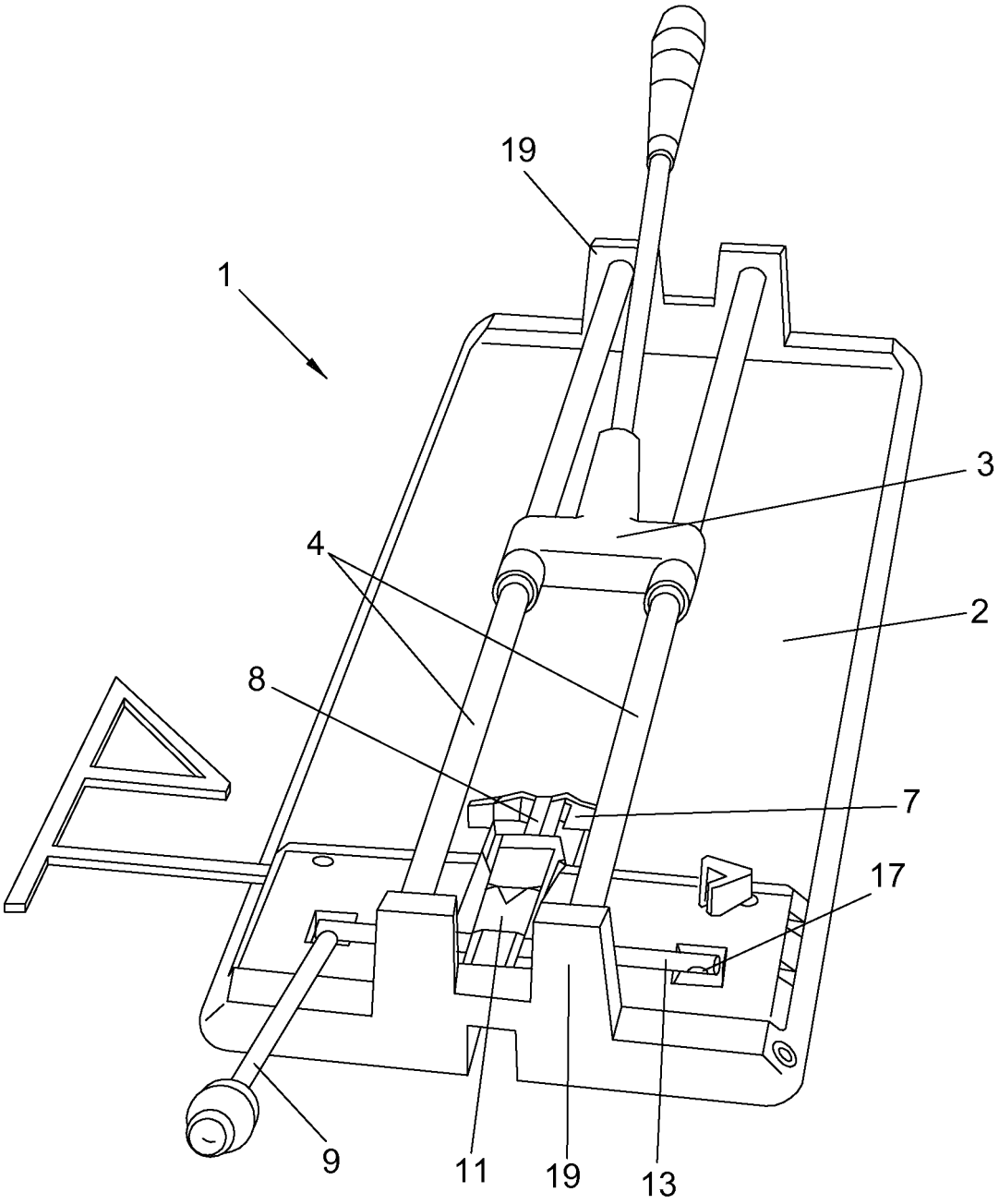


FIG. 1

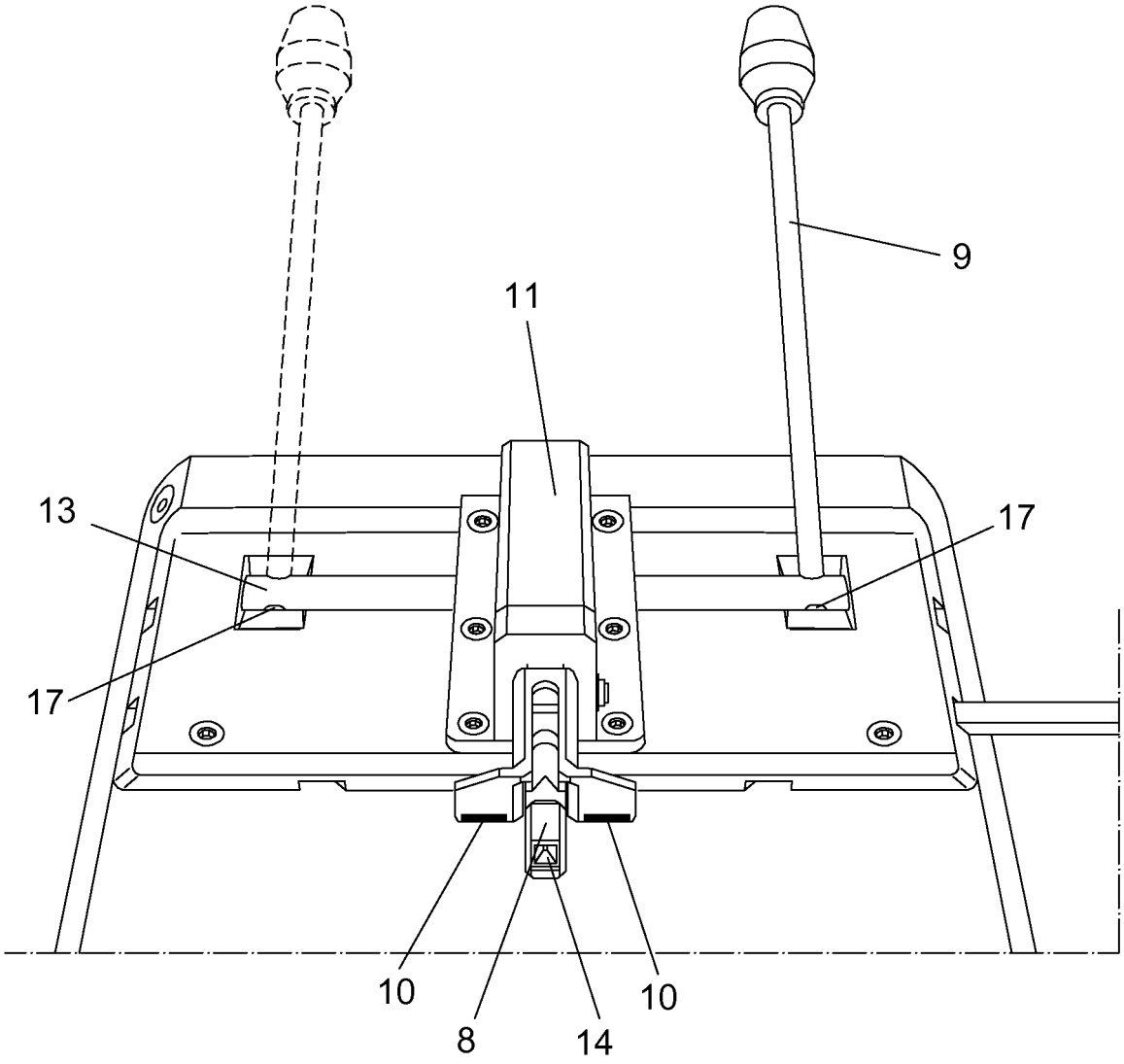


FIG. 2

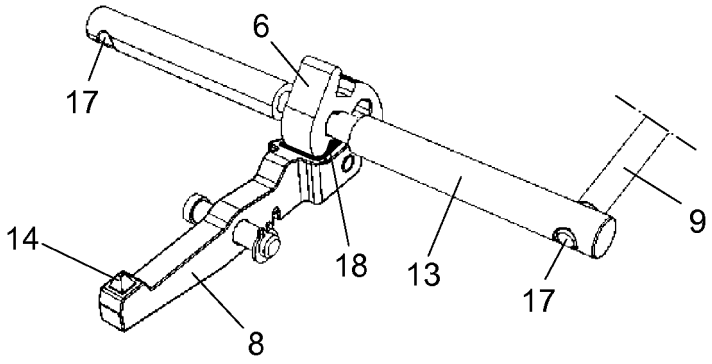


FIG. 3a

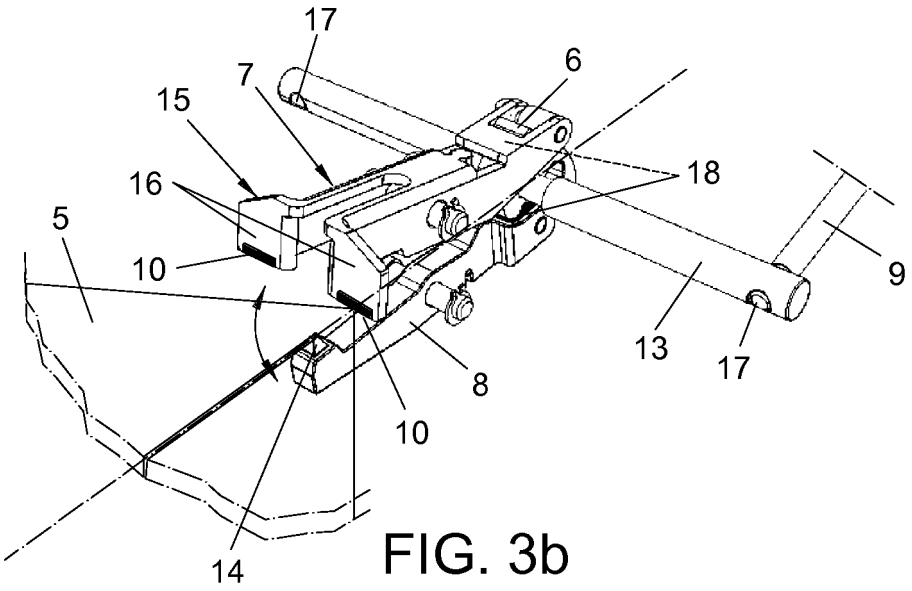


FIG. 3b

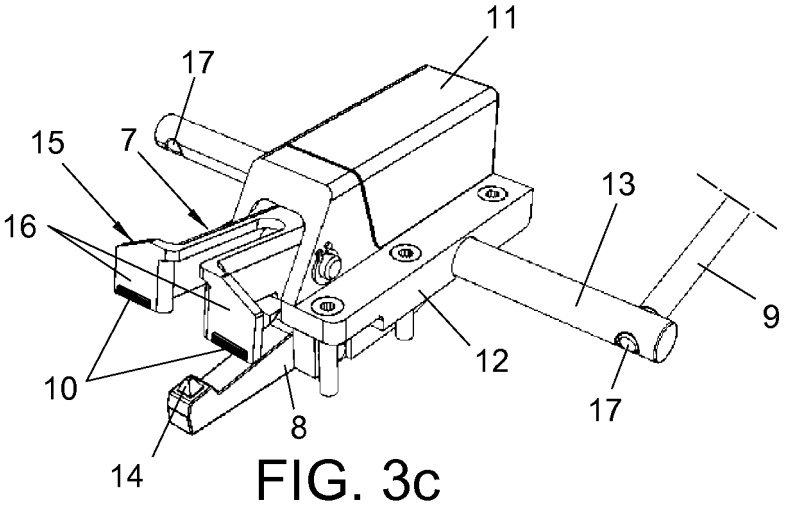


FIG. 3c

REFERENCES CITED IN THE DESCRIPTION

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